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# The Future of Non-Strategic Nuclear Forces

Are These Capabilities Still Needed? (U)

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April 30, 1991

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April 30, 1991

## **The Future Of Non-Strategic Nuclear Forces**

**Are These Capabilities Still Needed? (U)**

by

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### **ABSTRACT (U)**

The epochal political events of 1989-1990 are greatly influencing US non-strategic nuclear forces (NSNF). NATO NSNF strategy is undergoing revision. The London Communiqué of July 6, 1990 is the harbinger of an intense debate upon future NATO nuclear roles and missions. The President's cancellation of the Follow-on-to-Lance missile (FOTL) and the offer of withdrawal of forward-deployed nuclear cannon projectiles to NATO indicate downward trends in future NSNF stockpiles.

This report, in the form of an executive summary and an annotated briefing, presents the results of a yearlong policy and systems analysis investigation. The authors examine plausible rationale, first principles, that govern the justification for future NSNF. They then assess the capabilities of reduced stockpiles during 1995-2000 wherein regional powers may possess nuclear arms. By configuring three nuclear scenarios in which US vital interests are at stake, the authors analyze the number of NSNF weapons to investigate "how much NSNF is enough?" They also examine implications to the US Army should downward trends in short-range nuclear forces continue.

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**EXECUTIVE SUMMARY**Background

The world has witnessed such revolutionary changes over the past 18 months that clearly a new era has started. In this context, the authors undertook a study in late 1989 with partial Army support that would assess future European short-range nuclear force (SNF) structures and target sets. The rapidity of the political changes in Europe and the Soviet Union at the early stages of the effort motivated broadening the study to include strike non-strategic nuclear forces (NSNF) in a worldwide context. Also, the nature of the evolving era indicated that a traditional target-based analysis would be sadly deficient without underlying policy and economic assessments. These assessments have led us to conclude that, even more than before, future stockpiles will not be determined strictly on the basis of threat target defeat. Stockpiles will be configured from a complex interaction of domestic and international politics, defense budgets, arms control treaties, and differing threat perceptions.

The events in Europe are also affecting US NSNF strategies for other theaters. The outcome of future Nuclear Weapons Requirements Studies (NWRS) from the nuclear CINCs may profoundly affect NSNF roles and missions of the services. Trends in late 1990 were moving toward a denuclearization of the Army in the sense that organic nuclear systems might be retired.

Therefore, this paper examines the 1995-2000 rationale, roles, and capabilities of US NSNF in light of the revolutionary changes in Europe, plausible future nuclear threats worldwide, and downward trends in NSNF due to economic and political pressures.

Policy Findings: Strong Reasons for NSNF

The strategy and policy reassessment of US NSNF identified strong rationale for a continued role:

- As a visible instrument of superpower status in an uncertain and unpredictable world
- As a deterrent to future non-superpower nuclear-capable adversaries in a proliferated world
- As a deterrent to regional Soviet or Russian aggression as long as resurgence or reconstitution remains feasible
- To provide stability and insurance in a post-CFE Europe through a small air-delivered, forward-deployed force

Because of European politics, US NSNF structure decisions must be broader than peacetime NATO strategies, policies, and constraints.

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The force assessment finds utility from a span of non-strategic delivery capabilities: deterrence credibility, force survivability, launcher availability and responsiveness, and appropriate response options. A triad of delivery modes, sea, air, and land, inherently provides the most flexible spectrum of options to the National Command Authority (NCA).

We analyze three potential scenarios where NSNF could prevent or terminate war. In addition to a reconstituted Soviet theater threat, two regional nuclear adversaries, for example, a North Korea armed with nuclear weapons and a federation of Iraq and Iran also with nuclear weapons, are representative of future nuclear threats where US vital interests might be at stake.

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Force Structure Findings: SRAM T and organic Army SNF offer significant deterrent value

The need for SRAM T and Army organic SNF rests upon perceptions of future threats. We configured a range of threats that, we would argue, are credible in a multipolar world where nuclear weapons are proliferating. The prospect of such a world is not encouraging. If the policies of the US involved confrontation with threats of the magnitude depicted here, then a reasonable number of targets to hold at risk equal about fixed targets and divisions.

The quantitative analyses of the three scenarios and the force structure assessments present strong, if not compelling, arguments in favor of SRAM T deployment.

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Equally strong arguments exist for the Army to keep at least a residual organic capability with the

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Besides those DCA requirements, the assessments point to the deterrent utility of Army SNF inherent in its responsiveness, availability, and survivability. Maintaining a residual organic capability with the pending the

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identification and development of a more capable system, provide the following benefits.

- Cheap to maintain
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  - New operational concepts available for minimal force structure
- Avoids cost of changing roles/missions
  - Joint command, Air Force, and Navy implementation costs substantial
  - Army doctrine, training, and leadership still required for integrated warfare
- Three-service NSNF more credible deterrent and more capable force
  - Avoids unrealistic demands upon AF/Navy DCA
  - Enhances survivability
  - Timely responsiveness for the battlefield
  - Stronger motivation for enemy forces to disperse
  - Not weather constrained

#### Recommendations

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with these elements:

We also recommend a joint Army-DOE study

- Formally assess future Strategic Army battlefield nuclear rationale, missions, and operational concepts in light of current trends
- Examine organic Army force structure and organizational alternatives, facilities, and deployment requirements
- Define technical system options for future organic nuclear fire support alternatives.

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## I. INTRODUCTION

- Purpose
- Scope
- Objectives

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Non-strategic nuclear forces (NSNF) have composed a significant portion of the US nuclear stockpile due, primarily, to their deterrent capabilities against the Soviet Union and its conventional and theater forces. But the political watersheds of 1989 and 1990 in Europe are causing, and rightfully so, NATO governments, policymakers, and the public to challenge the need, roles, and composition of US forward-based nuclear systems.

The events in Europe are also affecting US NSNF strategies for other theaters. The outcome of future Nuclear Weapons Requirements Studies (NWRS) from the nuclear CINCs may profoundly affect NSNF roles and missions of the services. Current trends are moving in the direction of a denuclearization of the Army in the sense that organic nuclear systems might be retired

This paper examines the future rationale, roles, and capabilities of US NSNF in light of the revolutionary changes in Europe, plausible future nuclear threats worldwide, and downward trends in NSNF from economic and political pressures.

We conclude that NSNF still have a critical role to play within future US defense strategy. Our findings (summarized on pages 62-63) include the need for a flexible and versatile force through a variety of systems, including an organic Army capability and an Air Force theater stand-off capability, but at substantially reduced numbers from the present. The rationale for US NSNF should broaden its focus from Europe, where a small force of air-delivered munitions may remain for stability and insurance, to one embracing roles both as a deterrent against future regional adversaries with incipient nuclear capabilities, and also as a US political instrument of power in a multipolar world.

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This briefing summarizes an extensive 12-month analysis of:

**+ Changing European Politics**

ECAP, JOWOG, NWDG meetings; NATO policy papers and discussions

**+ Evolving US and DoD Policies**

Current & programmed US NSNF

**+ Future Conventional and Nuclear Threats**

Intelligence Community

**+ Future Target Sets**

Types, locations, characteristics

**+ Army Organic SNF Implications**

Army staff, TRADOC, JCS, OSD

The world has witnessed such revolutionary changes over the past 18 months that clearly a new era has started. In this context, we initiated a study in late 1989 with partial Army support (TRADOC TRAC-Leavenworth) that would assess future European SNF structures and target sets. The rapidity of the political changes in Europe and the Soviet Union at the early stages of the effort, however, necessitate a broadening of the study to include strike NSNF in a worldwide context. And the nature of the evolving era indicated that a traditional target-based analysis would be sadly deficient without underlying policy and economic assessments. Indeed, these assessments have led us to conclude that, even more than before, future stockpiles will not be determined strictly upon defeat of threat targets. Stockpiles will be configured from a complex interaction of domestic and international politics, defense budgets, arms control agreements and finally, differing threat perceptions.

Shown above is a summary list of the areas and sources that provided information. The views expressed are those of the authors and do not reflect official US government positions.

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Objectives

Investigate the rationale and roles for future US NSNF stockpiles

Assess capabilities of US NSNF given limited NSNF systems and numbers

Examine implications for Army nuclear forces

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The objectives listed above and on the next page stem from six major issues that raise uncertainty as to the need and size for NSNF. Taken as a whole these issues will certainly lead to substantial reductions in the US NSNF war-reserve stockpile. Some influential thinkers will argue that central strategic systems can, and even must, take over all of the roles and missions of NSNF. Other analysts will support NSNF but at reduced levels, raising the question of 'how much is enough?'.

The first issue concerns the gradual ascension of multipolarity in world political and economic relationships, even prior to the epochal restructuring in Europe. A number of industrialized countries have become powers in their own right. Other third-world nations have the potential to become regional powers with the proliferation of advanced technologies. Clearly this diffusion of power has profound implications upon US defense strategy.

Second, the collapse of the WTO and the severe economic dislocations facing the Soviet Union have led to a greatly diminished Soviet threat to the NATO alliance. NATO nuclear strategy reviews will be the focus of unprecedented debates in the Atlantic community over the next year.

The third issue pertains to the impending CFE and START treaties. The President's offer to withdraw artillery-fired atomic projectiles (AFAPs) from Europe, the cancellation of the Follow-on-to-Lance (FOTL), and the termination of the DELETED are indicative of future SNF and NSNF arms control understandings and agreements.

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Objectives (contd)

Investigate the rationale and roles for future US NSNF stockpiles

Assess capabilities of US NSNF given limited NSNF systems and numbers

Examine implications for Army nuclear forces

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The ongoing deficit crisis with large reductions in military manpower and procurement budgets, the fourth issue, portends significant NSNF reductions and cancellations. The Congress will scrutinize production monies for the SRAM T and B90 NDSB. A very real prospect is no new NSNF production starts for several years.

A fifth issue is the continuing promise of advanced acquisition and nonnuclear technologies. These technologies, by acquiring and delivering lethal ordnance upon enemy fixed and mobile assets in near-real time, offer the potential for replacing some missions that previously required NSNF. However, analyses have demonstrated that these technologies, even when fully funded, deployed, and reliably delivered, cannot replace NSNF forces for deterrence or for effectiveness against many target classes.

The last issue concerns proliferation of nuclear technology to third-world nations. How does the US deter a non-superpower regional adversary from using its few nuclear weapons against committed US forces? Should we rely on our conventional might? On our central strategic forces? How should we respond if he actually employs nuclear weapons on committed US forces, causing massive casualties?

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## II. FORCE RATIONALE

### Force Rationale

- Past rationale
- Start of a new epoch
- Determinants of a future US NSNF strategy

### Force Assessment

- Roles and attributes
- Systems
- Numbers

### Force Structure

- Army SNF
- SRAM T

### Summary

- Findings
  - Recommendations
- 

To understand the future rationale for NSNF, we first consider the past reasons for having NSNF. We then explore in more detail the epoch-making changes in Europe, and how these might affect forward-deployed forces. We then argue what the main strands of a future US NSNF strategy ought to be (summarized on page 25).

This type of effort can quickly be overtaken by world events and decisions made at the national level. The report describes potential NATO and US policy directions gleaned from a number of forums and reports through December 1990. It is not meant to describe official US policy; instead it prescribes our policy recommendations derived from current trends. It then assesses the capabilities of shrunken US NSNF within three theaters of vital US interests where NSNF might be evoked against nuclear-armed adversaries.

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**The old *raison d'être* for US NSNF: the Soviet Threat**

1. Democracies and economies of Western Europe
2. The overriding threat: the Soviet Union
3. NATO was unable to provide sufficient conventional forces
4. Deployment of nuclear weapons to Europe created an extended deterrence umbrella for conventional force deficiencies

**Other US CINCs were also allocated  
NSNF for deterrence of the worldwide  
Soviet Threat**

Initially behind the deployment of US forward-based nuclear forces has been the threat of Soviet landpower, and subsequently the Soviets' own theater nuclear capabilities. The victory of the allies in the Second World War led to several unforeseen events: one was the raising of the Iron Curtain in the late 1940s through the subjection of Eastern European countries by the Soviet Union. The US, after fighting a war against totalitarianism, turned to a grand strategy of containment of Soviet imperialism. A free and prosperous Western Europe continued to be of utmost interest to the US; and therefore, the NATO alliance was formed to draw the line against further Soviet expansion. Unfortunately, the Soviet Union and its Warsaw Treaty Organization (WTO) alliance deployed forces far beyond those required for its own defense. Unable and unwilling to match the conventional force goals of the 1952 Lisbon Conference, the US deployed its first theater nuclear weapons for NATO in 1953.

Over the past 45 years, NATO nuclear doctrine has evolved from "massive retaliation" in MC 14/2, to "flexible response" in MC 14/3, then to the development of provisional political guidance (PPG) for initial and follow-on nuclear use, next to the Montebello modernization decisions, and now to the proposed "weapons of last resort" from last summer's London communique. But behind all of these declaratory doctrines and revisions, excepting the last, has been the massive Soviet threat.

The US strategy of extended deterrence, operative with the forward-deployment of US weapons and nuclear guarantees to the allies, has created a tension between the Europeans and the US. The presence of US weapons in Europe has been emphasized by the Europeans as a coupling to the US Central Strategic Forces. Hence, the specter of Armageddon must always reside in the calculus of the Soviet Union. Conversely to the US, the presence of theater nuclear weapons (now NSNF) gave an aura of credible response options before the ultimate response.

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Several important factors drove stockpiles to large sizes

- The size of the Soviet threat continued to grow
- The advances in nuclear weapon and delivery system technologies allowed for a myriad of theater/tactical delivery systems
- All three services deployed systems, developed operational concepts, and trained personnel to provide a variety of NSNF capabilities
- The political element of Allied participation for credible NSNF deterrence led to NATO programs of cooperation

---

One byproduct of the end of the Cold War will be a large build-down of NSNF warheads. This warhead reduction will be in the thousands, a legacy of the Cold War balancing between the US and the Soviet Union.

The two major powers have competed with such vigor that arsenals grew to thousands of theater nuclear weapons on both sides. The US and the NATO alliance perceived that the massive Soviet land and theater nuclear capabilities presented an unacceptable threat to Western Europe without the political and military power of large nuclear weapon inventories. Further, this Soviet threat grew and modernized without abatement until the economic realities of a nearly bankrupt economy began to become so apparent in the last two years. But even today the bureaucratic resistance and inertia to change exists: 'Comrades, we have converted our factories to produce washing machines and sewing machines....but half of the time a tank still rolls out.'

Another reason for the large stockpiles stemmed from the remarkable technological advances in the period of the 1950s to 1970s. Warhead and carrier developments allowed a myriad of systems to be developed and deployed. The apex of the Cold War fostered budgets and political support for nuclear weapons that might never be seen again.

All three services also justified the need for their own NSNF. For example, the Army spent considerable resources in the 1950s toward the development of the nuclear battlefield with the Pentomic Division, which involved an extensive process of developing and testing ground forces in simultaneous operations with conventional and nuclear fires. The other two services also devoted significant resources to their nuclear programs.

In NATO, programs of cooperation were instituted for allied participation in the US extended deterrence strategy, thereby increasing stockpiles.

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**The presence of NSNF in Europe contributed to the long peace of 45 years**

These weapons helped to deter the Soviet Union from initiating nuclear coercion or overt aggression against the NATO alliance

This occurred in spite of, or perhaps because of:

Ambiguities in NATO declaratory policies such as Flexible Response

Difficulties in developing battlefield nuclear weapon doctrine and concepts

Questions in survivability of NATO main operating bases

Unclear or unfavorable results from NATO nuclear exercises and war games.

The sheer destructive power of NSNF made the cost of a general European war too high, too uncertain about the prospect of victory, Pyrrhic or otherwise. NSNF engendered cautious behavior.

We argue that the existence of theater nuclear weapons was a major factor for the past 45-year peace in Europe. Prior to the stabilizing effects of NATO, due in part to its nuclear weapons, the European continent had been the scene of several major wars and periods of crises, largely stemming from rampant nationalism. The bipolar Cold War stabilized Europe, and the mass destruction available from nuclear weapons made a European general war too horrible. The evidence of NSNF contributing to the long peace of the past 45 years is persuasive:

- The Soviets in their own writings admit to unfavorable "correlation of force ratios" when NATO nuclear weapons are factored in.
- The danger of NATO nuclear use is clearly evident in their doctrine and training exercises. Dispersion of their forces is a norm prior to quick massing at the point of decisiveness.
- The Soviets undertook their own huge development and deployment program to field theater weapons for every practical delivery means.

The strategies of NATO worked. They worked in spite of ambiguities in NATO declaratory policies; ambiguities necessitated by political constraints and public acceptability. A number of employment questions and apparent deficiencies arose over the years as witnessed by changes in NATO doctrine (MC 14/2 to MC 14/3), results from exercises, and in recurring debates on NATO modernization such as the two-track decision.

But it all worked to keep the peace. The US policy of extended deterrence within NATO's nuclear declaratory and operational strategies made the cost of aggression too high to Soviet leaders. These weapons engendered cautious behavior. The costs of a general war became much too high.

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**NATO is entering a new epoch: its strategy is evolving**

- **The London Communique is a harbinger**
  - Proposal to WTO: Non-aggression treaty, no longer adversaries
  - Nuclear forces are weapons of last resort
  - Elimination of nuclear artillery shells
  - Significantly reduced role for sub-strategic weapons of shortest range
- **The Soviet Union is no longer perceived to be a credible threat to Western Europe**
  - No intentions to attack
  - Capabilities to conduct a theater strategic offensive no longer credible
  - Must mobilize and pass through neutral or unfriendly East European nation(s)
- **The economic and political imperatives are reducing NATO & Soviet forces**
  - Declining budgets for forward-deployed conventional and NSNF forces
  - CFE treaty reducing conventional armaments
  - Short-range nuclear force agreements

The revolutionary changes of the past two years demand that NATO adapt its nuclear weapon strategies in order to preserve political legitimacy and acceptability. The first official response to the new era is the London Declaration of July 1990. By recognizing the disappearance of the Soviet short-warning and large-scale theater strategic operations (TSO) threat, the communique discounts the need for short-range nuclear forces, and offers the elimination of nuclear artillery shells. Furthermore, the joint declaration stipulates that NATO nuclear weapon strategy is moving away from "flexible response" to "weapons of last resort." As part of this revision, the President terminated the Follow-on-to-Lance modernization program. Clearly, the debate is just starting and will be controversial as to the future shape of NATO nuclear policies and stockpiles.

Indeed, many NATO thinkers and policy makers maintain that the Soviet Union should no longer be considered an adversary since their aggressive intentions are gone. They argue that the collapse of the WTO and the planned withdrawal of Soviet forces from Eastern Europe by 1994-95 reduces their capabilities to, at best, limited aggression. Only the threat remains of a reconstituted and resurgent Soviet Union after lengthy mobilization, however remote. And the probability of that event is considered to be so small by many in NATO governments as to be no longer a politically legitimate scenario for the maintenance of large NSNF stockpiles in Europe.

The ongoing economic crises in the Soviet Union are to a lesser degree matched by the deficit problems of the US budget and the calls for a peace dividend. Other NATO nations are already planning for large defense reductions. Eventually the CFE treaty may act more as a floor to defense cuts rather than a ceiling. SNF understandings and agreements will be in the forefront of arms control negotiations pending completion of the CFE treaty.

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**First Rationale: Stability, not "deterrence",  
for European-based US NSNF in a post CFE Europe**

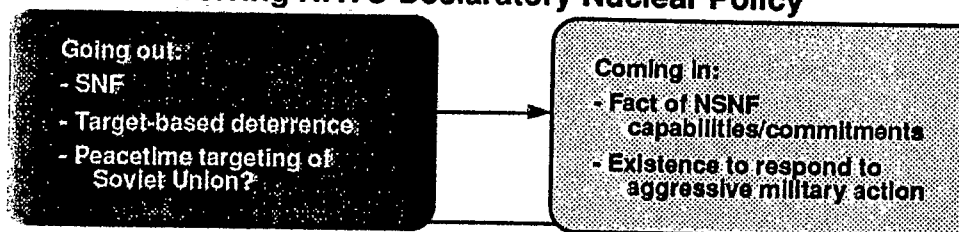
**1. An insurance policy, a hedge against future uncertainty**

- Stability with Allied POCs
- Balance power to restrain resurgent nationalism
- Preclude any potential opponent from contemplating aggression

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**Evolving NATO Declaratory Nuclear Policy**



Papers and briefings by NATO defense analysts are providing insights for the ongoing strategy review. These initial directions include a movement away from the traditional rationale of deterrence in its broad European connotations: as a counter to the large Soviet threat, peacetime employment planning, wartime direct defense, and so on. For public acceptability, declaratory policy may shift from deterrence in lieu of a Soviet threat, to one of "persuasion," "dissuasion," and "insurance". The elements of the insurance rationale are three-fold: stability and full Allied participation with the programs of cooperation during this uncertain era; the balancing role to prevent power blocs and ultra-nationalism from recurring in Europe; and finally, the traditional deterrent role of preventing war against any future aggressor, a resurgent Soviet Union or whomever.

In consonance with the London communique, SNF will clearly be withdrawn. Declaratory policy will indicate no nuclear targeting in peacetime, especially in light of the vanished large-scale Soviet threat. The sheer presence of nuclear weapons, and the fact that NATO can use them, might become the only announced tenets to preclude damaging debates between the NATO governments. This declaratory strategy may take on the connotations of an "existential" force that deters by its simple existence; but it is beyond the scope of this effort to predict the future operational concepts involving training, construction of options, and the nuclear infrastructure.

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It is our judgment that forward-deployment of SRAM-T to Europe will not be politically acceptable to the NATO governments and publics if current trends continue. The exact number of bombs might be determined by the number of allied DCA and MOBs necessary for current participation and adequate survivability.

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**But Future Regional Threats dictate three NSNF  
Deterrent Rationales broader than European stability forces**

**War prevention and war termination where US vital  
interests are involved:**

- 2. A visible symbol of national power in an uncertain & unpredictable multipolar world**
- 3. A deterrent to future non-superpower nuclear-capable adversaries in a proliferated world**
- 4. A deterrent to regional Soviet or Russian aggression as long as resurgence or reconstitution remains feasible.**

#### NSNF Roles

- An incalculable risk to the threat(s)
- Appropriate & credible non-strategic nuclear options including capabilities for in-kind nuclear response
- Direct defense of endangered US forces

The first major rationale for NSNF derives from its contribution as a political instrument and an insurance policy for the superpower US. Although not often on center stage in a number of regional disputes or conflicts, NSNF availability in the wings has certainly played an important role in diplomatic interchanges and crises.

A future nuclear-proliferated world would present enormous challenges to US defense interests. Over ten nations possess the capabilities to obtain nuclear armaments in the next decade. Several of these nations maintain profoundly hostile relations to the US. As regional powers in their own right with significant conventional armaments, their addition of nuclear capability would raise grave risks to deployed US forces.

While the aggressive intentions of the Soviet Union towards Europe may have disappeared, their conventional and nuclear capabilities remain huge. While the short-warning scenarios are no longer credible, a future resurgent and mobilized Soviet Union remains feasible. While intentions can move towards amicability, they can subsequently be reversed upon change in leadership. The Soviet Union or the greater Russian Republic, should some republics become autonomous, may have future cause to counter US vital interests in critical regions such as Southwest Asia, despite present trusts.

Therefore, we are incredulous of US forces without NSNF to prevent war or to terminate war against hostile nuclear-armed states. The rationale for NSNF must rest upon its capabilities to deter a plausible resurgent Soviet Union, or any of several regional powers with potential nuclear capabilities. As NSNF kept the long peace in Europe because it engendered cautious behavior, so should NSNF be kept as an incalculable risk towards any nuclear state contemplating aggression.

The rationale for NSNF also involves the element of credibility: the NCA should have options other than central strategic forces for an appropriate response.

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US NSNF structure issues and decisions should be  
broader than peacetime NATO strategies and policies

European political imperatives unsupportive of NATO NSNF modernization  
(except for safety and security enhancements to air-delivered weapons)



NSNF rationales support some US nuclear capabilities kept up-to-date



CONUS-based NSNF, subject to US political and budgetary constraints,  
can then be streamlined to meet broader US NSNF military requirements

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This study points to an expansion of the US rationale for having NSNF. Their *raison d'être* has been to deter the massive Soviet threat to Western Europe. Now that this threat has been discounted by most policymakers, reasons for continued NSNF capabilities should be publicized. The US ought to forward deploy a relatively small stockpile of air-delivered munitions and DCAs as a hedge against uncertainty, but modernization for NATO likely will be foreclosed except for safety and security enhancements.

The rationales as a superpower instrument, to deter a resurgent Soviet Union, and to deter future nuclear capable regional powers in contingency operations require up-to-date NSNF capabilities. US decisions on force structures and issues must be broadened beyond the narrow confines of NATO acceptability to include worldwide US requirements. Decisions upon the character and composition of future CONUS-based NSNF will be subject to severe domestic political and budgetary constraints as is. NSNF ought not to be held captive to European concerns especially when they are not to be forward-deployed except in crises.

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**Strategic Arms treaties with the Soviet Union  
might strengthen the rationales for NSNF**

- ✓ The Impact of fewer strategic weapons under START I, and far fewer under START II, will:
- Reduce the availability and responsiveness of strategic bombers to non-strategic missions
  - Decrease the probability of employing scarcer SLBM and ICBM systems (with their MIRVs) on other non-strategic targets
  - Reinforce the perceptions that use of central strategic assets in many NSNF scenarios is not credible.

But limited use of strategic bombers with ALCMs or SRAM II can provide the capability to fulfill some NSNF missions.

Many defense analysts argue that current political and budgetary trends will lead to a blurring of the traditional distinction between strategic and theater nuclear forces. We contend that this distinction will remain useful, especially as strategic forces decrease.

DELETED

These forces may have just sufficient capability to meet US national strategic policy, that is, a countervailing capacity to deter the Soviet Union from accomplishing strategic war aims. Drawdowns to these forces for non-strategic missions might jeopardize the deterrent posture of the US

In specific terms, the strategic bomber fleet will be considerably smaller post-2000. Given their important contribution to Single Integrated Operation Plan (SIOP) options on the Soviet Union, it is questionable that they would be available in sufficient numbers except for very limited NSNF options, wherein only a few bombers are needed.

The restrictions for employing ICBMs and SLBMs are operationally much more severe due to footprinting. The use of intercontinental ballistic missiles also would risk misperceptions of all-out strategic exchange as to be, in our opinion, not credible for limited non-strategic deterrence.

DoE  
6.2(a)  
DoD

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## Non-Strategic Nuclear Forces: A Key Element of Deterrence

## MISSIONS

		SIOP Strategic	Strategic	Non-Strategic
F O R C E S	Strategic (Strategic Triad)	√√√. [All]	√. [All]	√. [Bomber]
	Non-Strategic (DCA, TLAM-N, SNF)	√. [TLAM-N]	√√. [DCA, TLAM-N]	√√√. [All]

Missions:

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DOE  
6,2 (9)

The missions of the nuclear forces include the major attack options (MAO) of the SIOP, other strategic options against targets on Soviet territory, and non-strategic options against targets not on Soviet territory. To accomplish these missions, either strategic forces (the strategic triad) or non-strategic forces (DCA, TLAM-N, or Army short-range nuclear forces) can be employed.

Non-strategic nuclear forces fulfill important strategic and non-strategic missions. Their capabilities as a less escalatory option than strategic nuclear forces are most important in non-strategic roles (three checks in the figure) and in less than all-out SIOP roles against targets in the Soviet Union (two checks in the figure).

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Rationale Findings

1. NSNF should remain a key element within US defense strategy
  2. Rationale for existence is for broad worldwide contingencies
    - Visible instrument of national power in a multipolar world
    - Deterrence of future regional adversaries with nuclear capabilities
    - Deterrence of reconstituted Soviet theater threats
    - Forward-deployed force for stability in Europe
  3. US NSNF structure issues and decisions should be broader than peacetime NATO strategies and policies
  4. Reductions in strategic forces may strengthen rationale for NSNF
- 

NSNF, in summary, should continue in its important role towards keeping the peace. Their rationale must broaden from a NATO *raison d'etre*, where a small force furnishes stability and insurance in Europe, to worldwide contingencies. These include the deterrence of a reconstituted Soviet Union and of future nuclear-capable regional threats. As a superpower, the US ought to maintain NSNF as a visible symbol in our relations within a multipolar world. Therefore, US NSNF structure issues and decisions should be made in the broad context of worldwide US strategies and policies. Reductions in strategic forces might strengthen the rationale for non-strategic nuclear systems.

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April 30, 1991

### III. FORCE ASSESSMENT

**Force Rationale**

- Past rationale
- Start of a new epoch
- Determinants of a future US NSNF strategy

**Force Assessment**

- Roles and attributes
- Systems
- Numbers

**Force Structure**

- Army SNF
- SRAM T

**Summary**

- Findings
  - Recommendations
- 

The study now evaluates the desired attributes and potential sizes of the force to fulfill its revised rationale. The scope of the study covers approximately the next five to ten years so that the boundary conditions are current and programmed weapon systems, and force levels.

This analytic section assesses NSNF capabilities within three non-strategic contingencies in which nuclear systems may have to be targeted against threat fixed and mobile targets for war prevention or termination. One contingency embodies a resurgent and reconstituted Russian threat. The other two contingencies incorporate future regional nuclear-capable adversaries. The analyses of the three contingencies confirm that large NSNF stockpile reductions are acceptable.

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**Credible deterrence**

**necessitates *will* to employ nuclear weapons as  
expressed in declaratory strategies and roles,  
and effective military *capability***

Capability is assessed in this study  
by analyzing the effectiveness of  
arms control-restricted, policy-driven,  
and budgetary-constrained stockpiles  
against reduced target sets

---

An axiom – the degree of nuclear deterrence relates directly to will and to capability. Declaratory strategies and roles ought to express national will in explicit terms that will deter potential adversaries. Capability ought to be visible, perceived as effective, and trained with in peacetime to ensure that no doubts are raised concerning its credibility during crises or armed conflicts.

For the post-Cold War era, the target sets reflect substantial reductions in type and numbers. The availability of two systems, the Air Force SRAM T and the Army ~~DELETED~~ for the 8-in. howitzer, is questionable in light of ongoing arms control, policy, and budgetary debates. The capabilities analyses that follow incorporate these considerations.

OSD 3.3 (6)(4)

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**US NSNF desired attributes****1. Attributes for CONUS force for contingency operations**

- Sufficient spectrum of options for appropriate response
- Span of yields and weapon ranges
- Modern theater safeguard and security features
- Deployable in sufficient numbers with entry forces
- High probability of arrival and survival

**2. Attributes for European forward-deployed force for stability**

- Political constraints (gravity bombs/DCA)
- Modern safeguard and security features

---

To ensure an effective deterrent in contingency operations, as a balance to a future reconstituted Soviet threat, and as a force for stability in post-CFE Europe, the non-strategic nuclear force should possess certain attributes and capabilities.

For war prevention and war termination in contingency operations, the CONUS-based force attributes should incorporate: sufficient options for appropriate response, comprising a span of yields and ranges; modern safeguard and security features for command and control in unstable and risky deployment areas; rapid deployability with US entry forces; high alert rates and reliability for responsiveness; and high probabilities of arrival on target. Together, these desired characteristics deter war as a highly effective, responsive, and credible means to punish potential aggressors by holding their valued war-making assets at extreme risk.

For a forward-deployed force for stability in Europe, NSNF attributes must pass the litmus test of acceptability. Under current political imperatives and constraints, the force may be limited to air-delivered weapons, in particular gravity bombs. SRAM T might gain acceptability if relationships deteriorate with the Soviet Union. Clearly, up-to-date safeguard and security features are the most persuasive attributes towards modernizing the forward-deployed force. A force size of a few hundred weapons will likely result from satisfying the twin requirements of allied participation and "reasonable" main operating base survivability.

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April 30, 1991

**Current and programmed systems can provide a spectrum of options**

- Options against deepest high-value threat assets  
 TLAM-N ~~DELETED~~  
 F-15E or F-111 with SRAM T ~~DELETED~~ (recallable; stand-off)
- Options against close to deep fixed targets  
 F-16, F-15E, F-111 with ~~DELETED~~ radius;  
 man-in-loop) or SRAM T
- Options against troop assembly areas and maneuvering divisions  
 A-6, F/A-18 with ~~DELETED~~ radius)
- Options against troop assembly areas and maneuvering divisions  
 Army ground systems  
 AF DCA with gravity bombs, only with extensive changes to doctrine, training, and employment

DOD/AF  
1.4(a)

OSD  
3.3 (b)(4), (5)

**A triad of basing modes - at sea, on main operating bases, and in the bushes - provides for highest survivability, greatest flexibility, and widest spectrum of options.**

Do current and programmed systems provide a sufficiently wide spectrum of options for credible deterrence? Although the types of strike NSNF as defined in the current nuclear weapon stockpile memorandum does not encompass a perfect set (new Army ground system needed to replace ~~DELETED~~ AFAP), the three-service combination of NSNF appears to be robust. TLAM-N and SRAM T employment against the deepest fixed targets, DCA and gravity bombs and SRAM T against closer fixed targets, and Army ground systems against mobile forces offer adequate capabilities in range and responsiveness against most targets.

A span of NSNF delivery capabilities ought to be maintained for deterrence credibility, survivability, availability, responsiveness, and appropriateness. A triad of delivery modes (sea, air, and land) inherently ensures the most flexible spectrum of options to the NCA.

The problem arises when one considers the credibility of today's nuclear weapon force projections. Many opposing factors are at work that may result in the cancellation of the SRAM T, the withdrawal of Army organic capabilities, and the termination of TLAM-N production. We shall discuss these implications upon SRAM T and the Army systems in Section IV.

OSD 3.3 (b)(4), (5)

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April 30, 1991

Current and programmed force systems  
provide a span of yields and ranges

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DOE  
6.2(a)  
DoD/AF  
DoD

1990 planning documents of current and projected forces show a force with a wide span of yields and ranges. However, more realistic future projections cloud their availability.

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DOE  
6.2(a)  
DoD

option might be the transfer of Air Force DCA. to the Navy's strike

Another example would be early retirement of the DELETED

DELETED

is very effective against troop formations.

Many DCAs delivering gravity bombs would be needed to substitute, probably inadequately, for this capability loss.

A third example would be the cancellation of the SRAM T.

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this come about, might be a common system which can be delivered by both strategic and non-strategic aircraft. An option, should

OSD 3.3 (b)(4), (5)  
OSD 6.2(a)

~~SECRET~~

~~SECRET~~ /FRD

April 30, 1991

**Current and programmed systems can satisfy other desired NSNF attributes**

- Incorporate modern safeguard and security features
  - All: CAT D PAL or CAT F PAL; Modern WES; and Integral CD
- Deployable in sufficient numbers with entry forces
  - AF or Navy DCA with strike bombs and SRAM T
- Possess high probability of arrival
  - PLS (pre-launch survivability): TLAM-N, AFAPs
  - PTP (in-flight survivability): AFAPs, SRAM T
  - WSR (weapon system reliability): AFAPs, bombs, SRAM T

---

Current and programmed systems also fulfill the other desired attributes. Of singular importance in contingency operations conducted from undeveloped bases is the outstanding need for the most modern safeguard and security characteristics — appropriate permissive action link (PAL) technologies, modern warhead electrical systems (WES), and integral command disable.

The NSNF should contain rapidly deployable systems to accompany conventional forces under contingencies against nuclear-armed adversaries. Dual-capable aircraft can best meet this need by their inherent abilities when accompanied by rapidly-deployable logistic packages.

The systems should possess high probabilities of arrival, that is, high probabilities of pre-launch survival, of inflight survival, and of system reliability. In contrast to high PLS due to sea-basing for TLAM-N and to field deployment for AFAPs, we are concerned about the PLS of DCA under certain scenarios. The main operating bases might be vulnerable to concerted conventional attacks by a determined enemy, and especially vulnerable from nuclear strikes. The PTP might also pose problems for penetrating non-stealth DCA.

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April 30, 1991

Based upon IC projections we assumed an upper bound of three future regional threats to analyze NSNF stockpiles

1. Reconstituted Soviet Union or greater Russian Federation

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DOE  
6.2(a)

- *Casus belli*: nuclear coercion; imperialistic; survival; or economic
- Reentry into Eastern Europe; invasion into SW Asia/ Middle East

2. Pacific basin, regional nuclear adversary, e.g., North Korea

~~DELETED~~

DOE DoD  
6.2(a)

- *Casus belli*: nuclear coercion; invasion of South Korea

3. Middle East, regional nuclear adversary, e.g., federation of Iran and Iraq

~~DELETED~~

DOE DoD  
6.2(a)

- *Casus belli*: nuclear coercion; control of oil supplies; Arab federation to destroy Israel.

~~DELETED~~

DoD  
6.2(a)

Let us assume that the US would want to maintain an NSNF force for the rationale presented in Section II. This force should be configured to fulfill missions against a resurgent Soviet Union (or greater Russian federation) and against previously unnamed regional powers with incipient nuclear delivery means. Because the US has traditionally maintained conventional forces to fight in two directions -- across the Atlantic to Europe and towards the Middle East/Southwest Asia, and across the Pacific to the Far East --, we assume that future grand strategy will include the forces to undertake two contingency operations at the same time. And for insurance, the force should preserve the wherewithal in conventional and nuclear means to deter a reconstituted Soviet Union that might assist these regional powers.

Undoubtedly a reconstituted Soviet Union would drive US NSNF stockpile numbers (in addition to the forward-deployed nuclear weapons for peacetime stability in Europe). Their capabilities in NSNF remain almost awesome despite changing intentions and decreases in production of armaments. It is not necessary for our purposes to spell out the road to crisis or to war. It might be a future combination of nuclear coercion, renewed interest in East European domination, oil proclivities towards the Middle East, or others.

From lists of states that might have nuclear weapons and delivery platforms in the next ten years or so, we selected three states with intense animosities towards the US: North Korea, and a federation of Iraq and Iran. In the former case, the *casus belli* might be the reunification of the Korean peninsula under North Korean control. In the latter, the *casus belli* might be oil control, or a holy war to exterminate Israel. For either regional contingency, the opposing threat nuclear weapons would number less than a hundred.

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April 30, 1991

### Future NSNF options can be more limited in scope

#### 1. Initial Use Options:

- Credibly deter or respond to limited threat nuclear use
- Defeat the most important war-supporting and projection force assets

#### 2. Follow-on to Initial Use Options

- Credibly deter or respond to threat nuclear use
- Prevent overrun of committed US forces

#### 3. Selective Employment Options

- Credibly deter or respond to wider threat nuclear use
- Defeat high-priority fixed targets, defeat maneuver divisions

~~DELETED~~DoD  
1.4(a)~~DELETED~~DoD/AF  
1.4(c)DoE  
6.2(a)

Notwithstanding, we think that CONUS-based US NSNF must be configured to meet operational requirements against potential threats: specifically a reconstituted Russian threat and two third-world nuclear threats at the same time.

The escalatory steps, we believe, should number three: initial use options oriented to high-value fixed target defeat with several to 10+ weapons that are discriminative; other initial-use options oriented to mobile target defeat with tens of low yield weapons; and follow-on use options to defeat tens to 100+ fixed and mobile targets with a wide range of yields and systems.

~~DELETED~~

DoD

Under the three categories of options would be the mission to credibly deter aggression or respond to threat nuclear use. The traditional rationale of deterrence or restoration of deterrence would hold: war prevention and if need be, war termination.

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Capabilities analysis assumptions

- Probability of Arrival = 1
- Probability of Defeat/Damage (PD)  $\geq 0.90$  required for fixed targets: DELETED DoD
- Moderate fixed target damage VNTK: DELETED DoD
- Fixed target density is uniformly distributed
- All targets treated equally & independently with only one weapon per target; i. e., PD = PSSK  $\geq 0.90$
- Maximum combat radius (HI-Low-Low-HI flight profile) and delivery accuracies
  - TLAM-N
  - AF F-15E/F-111 DELETED DoE 6.2(a) DoD
  - AF F-15E/F-111
  - Navy A-6 with
- Optimum height of burst DELETED DoE 6.2(a) DoD

In general, we used a typical methodology and standard assumptions to arrive at stockpile requirements against the target sets.

The methodology assumed 100% reliably arriving weapon systems, one weapon per target, target elements uniformly distributed, and a 90% probability of single shot kill (PSSK). The target defeat criteria consisted of moderate VNTK damage on fixed targets and DELETED

when 30% of its elements were covered by at least DELETED (immediate bomb). An ECE was considered defeated DELETED

Furthermore, we accounted for range to target and the circular error probable (CEP) of the weapon systems. DELETED

DELETED

~~SECRET~~ /FRD

OSD 3.3(a)(4), (5)  
OSD 6.2(a)

~~SECRET~~~~FRD~~

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Capabilities analysis assumptions (cont.)

## • Prioritized weapon allocation on fixed targets

1. SRAM T, AF B61, Navy B61/B90, TLAM-N
2. AF B61, Navy B61/B90, TLAM-N

## • Two weapon allocations on mobile targets

1. ~~DELETED~~
2. ~~DELETED~~

• Weapon Launch Points~~DELETED~~DOE  
6.2(a) DoD

Under an assumption of 100% reliably arriving weapons, we prioritized the assignment of weapon systems. Against fixed targets the analyses assumed two cases, first with and then without SRAM T. Under SRAM T availability, we assigned SRAM Ts to those targets which they could range and defeat. If the target could not be defeated by SRAM T due to insufficient yield, then Air Force bombs were assigned if in range and with sufficient yield. If AF bombs could not defeat the target, then the range and yields of Navy bombs were analyzed. And in turn if the Navy bombs were not in range, then the TLAM-N was examined. If the fixed target still could not be defeated in single attacks, then it was considered not defeatable. The assignment of weapons for the second case where SRAM T was not available followed an identical approach starting with Air Force bombs.

Against mobile targets we examined two cases using the most appropriate weapon systems. Those cases included the ~~DELETED~~ only, and then Air Force DCA with ~~DELETED~~ only. TLAM-N is not considered as sufficiently responsive and flexible for mobile target assignments; Navy DCA could have been allocated if proper C3 interfaces are in place and SRAM T could also have been allocated if available in sufficient numbers. We did not include SRAM T in our mobile target analyses because its projected procurement turned out to be just adequate to meet fixed target requirements.

Weapon launch points were chosen for each of the ~~DELETED~~ contingencies. Once again a weapon could be assigned to a target only if in range.

DoD  
1.4(g)OSD 3.3(6)(4), (5)  
OSD 6.2(a)~~SECRET~~~~FRD~~

~~SECRET~~~~FRD~~

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Subsequent force requirements are bounded  
by reasonable estimates of probabilities of arrival

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DOD

DOE  
6.2(a)

Although we assumed probabilities of arrival (PA) of 1.0 in determining target defeat, the sizing of stockpiles requires assumptions on PAs. We assumed for the base case that the probabilities of pre-launch survival (PLS), weapon system reliability (WSR), and penetrability (PTP) determined in the ~~DELETED~~ were still credible. During this study, the services provided raw probabilities on AFAPs, DCA with SRAM T, DCA with bombs, and TLAM-N. The study participants included DNA, SAIC, staff from the three services, OSD, and the DOE laboratories. The PAs that resulted from the ~~DELETED~~ represent the best judgment of the participants and the most credible numbers available to us for sizing the stockpile. DOD

We tested the sensitivity of the stockpiles to PAs by developing a lower set of reasonable probabilities. These lower PAs are study estimates that represent a reasonable floor. Although the WSRs are unchanged, we assumed significantly lower PLSs and PTPs for SRAM T and DCA bombs. In spite of the uncertainties surrounding future threats, we believe that these PAs comprise a reasonable spectrum. DOD

OSD 3.3(b)(4), (5)  
OSD 6.2(a)~~SECRET~~~~FRD~~

~~SECRET~~ ~~FRD~~

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**Target Types: Reconstituted Regional Soviet Threat**

- Define fixed target set to include capability to thwart Soviet force projection threat

~~DELETED~~DOD  
1.4(c)

- Size mobile target set from 1999 post-CFE Army divisions

~~DELETED~~DOD  
1.4(c)

The Soviet fixed target list was redefined from the European target list of the SRAM T Phase 2 study. The revised target list incorporated only those high-priority targets located in the Soviet Union: command and control, communications, and theater airfields. In addition, we incorporated fixed targets that would support a resurgent Soviet projection force. These additional targets included POL facilities and theater nuclear weapon storage in selected republics.

We estimated that on the order of six divisions should be held at risk. Our approach was to take Intelligence Community projections of post-CFE Soviet divisions. Although the Soviets might have as many as ~~DELETED~~ active divisions, we assumed from IC projections that about ~~DELETED~~ would be available in a ~~DELETED~~ month mobilization. Our methodology was to hold at risk ~~DELETED~~ of the difference in divisions between attacking Soviet and available NATO divisions. The result was ~~DELETED~~ divisions.

DOD  
1.4(c)~~DELETED~~~~SECRET~~ ~~FRD~~

~~SECRET~~ ~~FRD~~

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Fixed Target Set: Reconstituted Soviet Threat

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DoD  
1.4(c)

The number of fixed targets to be held at risk in the resurgent Soviet Union case is ☐ The categories and numbers are as shown.

DELETED

DoD  
1.4(c)

~~SECRET~~ ~~FRD~~

~~SECRET~~ ~~FRD~~

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SRAM T Range Capabilities

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DoD  
1.4(a)

The analyses encompassed weapon system range from launch point to target.

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The map shows the  
the 364 fixed targets.

circles for each of the

air bases and

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DELETED

DoE  
6.2(a)  
DoD

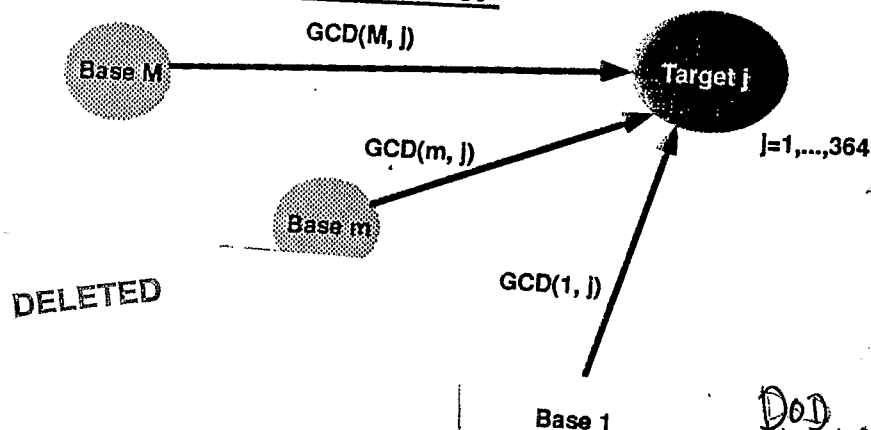
DoD  
1.4(a)

OSD 3.3 (b)(4), (5)  
OSD 6.2(a)

~~SECRET~~ ~~FRD~~

~~SECRET~~ ~~FRD~~

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The target assignment methodology assigned SRAM T (if available) as the preferred system. System CEP depended upon minimum range from the air bases but with a minimum of 100 km standoff to avoid terminal defenses. If SRAM T could not defeat the target in a weapon attack due to [REDACTED] then Air Force or Navy bombs were analyzed. Finally, TLAM-N was examined against remaining targets that could not be defeated by SRAM T or bombs (because of [REDACTED]).

DoD  
12469

05D 3.3 (6) (5)

~~SECRET~~ ~~SECRET~~



~~SECRET~~ /FRD

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NSNF Capabilities Analysis with and without SRAM T:  
Reconstituted Soviet Threat - Fixed Targets

DELETED

DOE  
6.2(a)  
DoD

Our results for the reconstituted Soviet fixed target set are given for two cases, with and without SRAM T. Of the DELETED targets, DELETED of the DELETED fixed targets can be defeated in DELETED attacks. (This graph and subsequent graphs assume the base case PAs).

DoD

DELETED

DOE  
6.2(a)  
DoD DoD

The main impact of not having SRAM T is shown in the number of DCAs now needed to penetrate to the target, and the number of TLAM-Ns needed to range the target set.

DELETED

DOE  
6.2(a)  
DoDOSD 3.3(6)(5)  
OSD 6.2(a)~~SECRET~~ /FRD

~~SECRET~~ /FRD

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**NSNF Capabilities Analysis with Reconstituted Soviet Threat- Mobile Targets** **DELETED**

**DELETED**

DOE  
6.2(a)  
DoD

The analysis against a force of maneuver divisions also contained two cases. The first case assumed that the Army maintained an organic capability through retention of the necessitated the Air Force to deliver against the mobile forces in lieu of Army organic capability.

DoD  
1.4(g)

The results demonstrate that DCA taskings would be substantial even, DoD  
against a objective of divisions

1 DoD

**DELETED**

DELETED

**DELETED**

7 DOE  
6,26  
DoD

Besides a stockpile that is almost greater, the potential DCA attrition might prove unacceptable.

Dot

OSD 3.3 (b) (5)  
OSD 6.2 (a)

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~~SECRET~~ ~~FRD~~

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**NSNF Capabilities Analysis of Four Stockpiles:  
Reconstituted Soviet Regional Threats**

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DoE  
6.2(a)  
DoD

Our summary of four potential stockpiles to cover the reconstituted Soviet threat is above. All four stockpiles are able to defeat ~~DELETED~~ fixed targets and ~~DELETED~~ attacking divisions. But the size and composition varies between the hypothetical cases.

DoD  
1.4(a)

The base case assumes that all current and programmed systems are available, in particular the SRAM-T and the ~~DELETED~~ AFAP.

DoE DoD  
6.2(a)

The second case assumes no ~~DELETED~~ capability.

DoE DoD  
6.2(a)

The third case assumes that SRAM-T is not produced.

DELETED

DoE DoD  
6.2(a) DoD

~~DELETED~~ Other Navy missions may preclude the availability of this number of TLAM-N.

The fourth case assumes that neither the ~~DELETED~~ nor the SRAM-T are

DoE DoD  
6.2(a) DoDOSD 3.3(4)(5)  
OSD 6.2(a)~~SECRET~~ ~~FRD~~

~~SECRET~~ ~~FRD~~

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**Target Types: North Korean Threat**

- Revise fixed target set to include future nuclear weapon capability

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DoD  
1.4(a)

The contingency against a nuclear-capable North Korea involved the revision of a Pacific fixed target list used in the [DELETED]  
 We eliminated all Soviet Union targets, but added several targets that would be necessary for a nuclear and chemical capability. The total target list amounted to [DELETED]

DoD

DoD

We sized the mobile target set in a similar fashion as was done previously for the Soviet threat. But we only included the heavy divisions in the calculation. The difference in heavy divisions (NK vs. ROK + US) amounts to [DELETED] heavy divisions; therefore, we assumed that [DELETED] of the difference, or [DELETED] divisions, had to be held at risk.

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DoD

OSD 3.3 (b) (5)

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~~SECRET~~ /FRD-

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NSNF Capabilities Analysis with and without SRAM T:  
North Korean Threat - Fixed Targets

DELETED

DoE  
6.2 (a)  
DoD

DELETED

DoD  
1.4 (c)  
DoE  
6.2 (a)  
DoD

targets are within DCA range: the  
unnneeded.

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Also note that all of the  
from TLAM-N is

OSD 3.3 (b) (4), (5)  
OSD 6.2 (a)

~~SECRET~~

70 1 1 2 2

~~SECRET~~ / ~~FRD~~

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NSNF Capabilities Analysis of Four Stockpiles:  
~~North Korean Regional Threats~~

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April 30, 1991

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DoD  
1.4(c)

We developed a Southwest Asia target set by modifying an earlier fixed target set from the ~~DELETED~~. The modification involved the deletion of all Soviet targets, the addition of high-priority and the inclusion of nuclear-related installations for both ~~DELETED~~. The mobile target set was constructed using the same methodology as before: coincidental to the North Korean scenario ~~DELETED~~ divisions had to be held at risk.

DoD

DoD  
1.4(c)

OSD 3.3 (b)(5)

~~SECRET~~ ~~FRD~~

~~SECRET~~ ~~#FRD~~

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NSNF Capabilities Analysis with and without SRAM T:  
Iraq and Iran Threats - Fixed Targets

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DOE  
6.2(a)  
DoD

In these simulated laydowns, ~~DELETED~~ of the ~~DELETED~~ targets could be successfully  
defeated in strikes. ~~DELETED~~

DoD  
DOE  
6.2(a)  
DoD

The impact of losing the SRAM T means a  
increase in DCA taskings to penetrate to the target, and the  
requirement that TLAM-N systems must be used for range extension.

DoD

OSD 3.3 (b)(5)  
OSD 6.2(a)~~SECRET~~ ~~#FRD~~



~~SECRET~~ ~~FRD~~

April 30, 1991

DoE  
6.2(a)  
DoD

DELETED

DoE  
6.2(a)  
DoD

DoD  
1.4(a)

OSD 6.2(a)

~~SECRET~~ ~~FRD~~

~~SECRET~~ ~~FRD~~

April 30, 1991

DOE  
6.2(a)  
DoD

DELETED

DOE  
6.2(a) DoD

To defeat ~~DELETED~~ fixed targets and ~~DELETED~~ divisions required the following weapon inventories:

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6.2(a)

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DoD

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DOE  
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DoD

(This demonstrates that the total stockpile quantities we arrived at are not very sensitive to reasonable PA bounds.)  
To defeat ~~DELETED~~ fixed targets and ~~DELETED~~ divisions required the following weapon inventories (under the sensitivity PA case):

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**Force Assessment Findings**

1. DCA with SRAM T/Bombs, TLAM-N, and W79 AFAP together possess proper attributes
2. Potential threat targets for worldwide contingency operations may number in the ~~DELETED~~ fixed targets and ~~DELETED~~

DoD

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DoD

In summary, the capabilities assessment arrived at these findings.

Future NSNF force attributes are best met with a triad of systems; air-delivered, land-based, and sea-based: for deterrence credibility, survivability, availability, responsiveness, and appropriateness. A triad of delivery modes (sea, air, and land) inherently provides the most flexible spectrum of options to the NCA.

Plausible threats in a future multipolar world could create as many as ~~DELETED~~ fixed targets and ~~DELETED~~ divisions.

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## IV. FORCE STRUCTURE

### Force Rationale

- Past rationale
- Start of a new epoch
- Determinants of a future US NSNF strategy

### Force Assessment

- Roles and attributes
- Systems
- Numbers

### Force Structure

- Army SNF
- SRAM T

### Summary

- Findings
  - Recommendations
- 

Section IV explores the implications of present trends upon Army short-range nuclear forces (SNF) and the Air Force SRAM T system.

We will discuss the implications to the Army for minimal or nonexistent organic nuclear capabilities. Present trends indicate that Army denuclearization is possible. Army doctrine, force structure, training, and joint service operations would be affected.

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**Army Nuclear Weapon Trends**

- W50/P1A & W85/P11 Systems Eliminated by INF Treaty
- FOTL Cancelled Spring 1990
- W82/155mm AFAP Cancelled Summer 1990
- W70/Lance Warhead Retirement Scheduled for FY93-98

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- US 8-Inch Artillery Retirement Starts ~ CY96 and Concludes ~ CY06
- Remaining Assets:

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- No ongoing conceptual weapon studies involving the Army, DoD, and DOE

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6.2(a)DOE DoD  
6.2(a)

Army nuclear weapon stockpiles are moving significantly downward. The cancellations or retirements of the Pershing systems, the new 155mm W82, the Follow-on-to-Lance (FOTL), and the Lance system means that 8-in. AFAPs comprise the remaining effective SNF. Furthermore, the 8-in. howitzer is scheduled to start leaving the active Army force structure around 1996, and to be out of the Reserve structure by 2006.

There are no ongoing conceptual weapon system studies for follow-on systems.

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Probable post-2000 Army nuclear fire support structureI. Minimal organic

- W79 and 8-inch Active or National Guard; ordnance detachments
- New battlefield system under development for post-2000?

or

II. Provided by NSNF Air Force and Navy assets

- Formal JCS assignment as new service role
- Revised /newly implemented battlefield target employment concepts
- Upgraded joint and Air Force/Navy planning agencies and C3 interfaces for nuclear air-delivery against mobile targets
- Dedicated DCA and B61 assignment/withholds
- Gravity bomb mobile-target SEPs

Most likely the post-2000 Army force structure will be a minimal organic one, or nuclear fire support will be provided by Air Force and Navy DCA using bombs.

The minimal organic force would probably be centered around a residual 8-in. capability. Although the force structure details must be studied by the Army, one possible option might be a dedicated FA brigade of two or three 8-in. battalions with worldwide missions but based in the US. Perhaps the brigade could be part of the Reserve components due to force structure constraints. Another option under consideration is to centralize all nuclear functions in an ordnance unit of about 128 personnel. This organization would be under the personnel reliability program (PRP) and maintain all nuclear command and control, logistics, and release operations. The artillery would fire the AFAP upon authentication from the ordnance detachments.

The second path would be to eliminate an organic capability and request nuclear fire support from the Air Force/Navy. We have listed some of the impacts that would result from this transfer of roles and missions. The impacts would be major and large in scope. First, the JCS would have to formally assign new service roles. The adequate substitution of air-delivered munitions for Army ground systems would embody extensive rework of battlefield employment concepts, the upgrade of joint nuclear planning agencies, and the improvement of C3 interfaces to implement and allow responsive delivery of bombs upon mobile targets.

In addition, the implications upon DCA missions are severe. These implications might involve the dedication of DCA to mobile target missions during crisis and war. Selective employment plans (SEPs) on marshalling areas and road march junctions would be needed.

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**We believe these are compelling arguments for maintaining an Army organic capability**

**1. Cheap to maintain**

- W79 exists
- New operational concepts for minimal force structure

**2. Avoids cost of changing roles/missions**

- Joint, Air Force, and Navy implementation costs substantial
- Army doctrine, training, and leadership still required for integrated warfare

**3. Three-service NSNF more credible deterrent and more capable force**

- Avoids unrealistic demands upon Air Force/Navy DCA assets
- Enhances survivability
- Enhances battlefield responsiveness
- Stronger motivation for enemy forces to disperse
- Not weather-constrained

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The arguments for maintaining an organic capability are strong. Our analyses have demonstrated that several hundred DCA sorties would be required to provide nuclear fire support. The reasons listed above further show the utility of maintaining an Army SNF capability. These include low Army costs, cost avoidance of changing service roles, enhanced survivability, responsiveness, availability, and effectiveness upon threat ground forces.

We recognize that arguments against this capability have been and will continue to be made. Essentially these arguments center on the perceptions that future enemy threats will be of such limited nature that other NSNF systems can be relied upon to prevent war or to terminate war without the need of organic Army systems.

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**Implications to the US Army  
from minimal or eliminated organic capabilities**

- **Leadership paramount**
  - Especially without organic fire support against nuclear-capable adversaries
- **Large force structure reductions, but not total elimination**
  - Limited to 8-in. active/reserve brigade or eliminated
  - Ordnance support detachments
  - CINC and Corps level fire support elements remain for nuclear targeting
  - Staff elements for user and developer communities remain but reduced
- **Specialized training requirement reductions, but not force nuclear training**
  - Total force trains for operations in nuclear environment
  - W79 technical training or removed
  - PRP only at dedicated units or eliminated
  - Career field 52 and designator 5H functions in far fewer numbers
- **Doctrine imperatives remain**
  - Dedicated 8-in./ordnance support or joint nuclear operation doctrine
- **Materiel development diminished but not eliminated**
  - W79 as interim system, follow-on options; or liaison with Air Force and Navy to satisfy Army fire support requirements

Following either path will profoundly affect the Army in its force structure, training, doctrine, leadership, and materiel developments.

Leadership in operations without organic nuclear fire support against nuclear adversaries will be even more important. Leadership will remain paramount.

Large force structure reductions are possible. Organic capability within a dedicated 8-in brigade or a centralized ordnance support unit means FA manpower from Lance and other nuclear force billets are freed up. Ordnance manpower would also be reduced. But fire support elements, particularly if joint nuclear battlefield operations become necessary, will require nuclear target analysts. Staff elements from the user and materiel developer communities can be reduced but would still be necessary.

We understand that training requirements could also be lowered. Technical training might be limited to the W79 system or removed. The personnel reliability program (PRP) should only be necessary at the dedicated artillery or ordnance units or eliminated. However, the total force would still have to train for operations on the nuclear battlefield. The career field 52 and target analyst specialty 5H would also be required but in fewer numbers.

Extensive revisions to doctrine and concepts of operations must be implemented especially if fire support is provided externally. The development of DCA missions to support ground forces will necessitate much joint doctrinal work.

Materiel requirements will clearly diminish. But if an organic capability continues with the W79, then conceptual studies for a post-2000 replacement ought to be initiated. If organic capability is removed, then technical liaison with the other services must be conducted. Materiel developments for defensive nuclear operations must also be continued.

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**Advanced Munitions cannot replace NSNF**

- Significant RDT&E remains to be funded and completed
  - Critical technical challenges in sensor development
  - Funding requirements are high
- Potential capabilities against mobile targets
  - If work as advertised, [ ] times as effective as dumb munitions
- ~~DELETED~~
  - Certain systems have limited effectiveness against heavy armor
  - High production costs preclude procurement in sufficiently large numbers
- Potential capabilities against fixed targets
  - Can defeat selected soft-point and small-area fixed targets
  - Cannot defeat hard point and large-area fixed targets

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ACMs, when developed and fielded, offer enhanced military effectiveness over dumb munitions against certain classes of targets. They do not possess all of the deterrence and lethality attributes of nuclear weapons.

An extensive amount of analyses have been completed upon the effectiveness of advanced conventional munitions (ACMs). The results of the work at Lawrence Livermore, Sandia, and Los Alamos support the above summary. We include it in this report because many ACM proponents have overstated probable battlefield effectiveness and overlooked war deterrence attributes (or lack thereof). Their argument is not whether short-range nuclear weapons are needed or not for their effects, but that ACMs can substitute with "near-nuclear" effectiveness.

The extensive analyses of the 1980s support this conclusion: ACMs, when developed and fielded, offer enhanced military effectiveness over dumb munitions against certain classes of targets. They do not possess all of the deterrent or lethality attributes of nuclear weapons.

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## The Pros and Cons of a SRAM T System

- Arguments In Favor *vice* SRAM II

- Permits delivery by theater aircraft for appropriate response
- Incorporates lower yields for minimal unwanted damage and political constraints
- Includes CAT F PAL for safety and security

- Arguments In Favor *vice* Bombs

- Provides stand-off capabilities and lowers aircraft attrition against defended NSNF targets
- Reduces the number of DCA withholds and sorties

- Arguments In Favor *vice* TLAM-N

- Reduces need for TLAM-N because of range extension

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We now turn to the arguments for and against a SRAM T capability.

Above are summary arguments that we believe are compelling for a SRAM T deployment.

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The analyses presented show that SRAM T can allow a very significant reduction, about ~~DELETED~~ the number of DCA missions that require penetration to the target. And due to its range extension, the number of TLAM-N missions was cut by more than ~~DELETED~~

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1.4(a)

Counter-arguments to the SRAM T are two: (1) in spite of the chances for high aircraft attrition, the future threats may be so reduced that the Air Force and Navy will have sufficient DCAs and bombs; and (2) the future threats may also be so reduced that strategic bombers and SRAM II or ALCM can satisfy all missions.

We have shown that the large size of plausible threats and the need for appropriate and credible NSNF options point to a continuing requirement for SRAM T.

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Force Structure Findings

- Army Organic Nuclear Forces
  - Trends toward denuclearization or minimal with W79
  - Compelling arguments exist in favor of organic capability
  - Reduction but not elimination:
    - Force structure, training, materiel development
  - Doctrine and leadership imperatives unchanged
  - ACMs cannot replace nuclear weapons
- SRAM T
  - Standoff capability and range extension needed for theater DCA

---

The force structure assessment establishes strong reasons for maintaining an organic Army nuclear capability, despite current trends towards denuclearization. Perhaps the single most important element is not dedicating limited and valuable DCA to conduct nuclear fire support on enemy troop formations when deeper fixed targets must also be held at risk.

Current trends towards denuclearization or minimal support may have far-reaching effects upon the Army. Substantial reductions in force structure, training, and materiel development are possible. But these imperatives, along with doctrine and leadership, will not be eliminated.

Compelling arguments exist for a more robust DCA force through the deployment of SRAM T. These include standoff from terminal defenses for survivability, range extension to deep targets, and delivery by theater aircraft for credible and appropriate response.

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## V. SUMMARY

### Force Rationale

- Past rationale
- Start of a new epoch
- Determinants of a future US NSNF strategy

### Force Assessment

- Roles and attributes
- Systems
- Numbers

### Force Structure

- Army SNF
- SRAM T

### Summary

- Findings
- Recommendations

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The final section of this paper concludes with a summary of the previous findings; and based upon these findings, offers recommendations.

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1. Strong rationales for CONUS and sea-based NSNF

- Visible instrument of national policy in an unpredictable, multipolar world
- Deterrence of future regional adversaries with nuclear capabilities
- Deterrence of reconstituted Soviet or Russian theater threats

## Rationale for European forward-deployed force

- Stability and insurance in post-CFE Europe

2. Reduced stockpiles from three regional threats and for European forward-deployment for stability

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The strategy and policy reassessment of NSNF identified strong rationale for their continued existence:

Visible instrument of national power in a multipolar world

Deterrence of future regional adversaries with incipient theater nuclear capabilities

Deterrence of reconstituted theater threats from a resurgent Soviet Union or Russian Federation

Forward-deployed force for stability in Europe

And because of the current European political climate, US NSNF structure issues and decisions should be broader than peacetime NATO strategies, policies, and constraints.

A span of theater delivery capabilities should be maintained for deterrence credibility, survivability, availability, responsiveness, and appropriateness. A triad of delivery modes (sea, air, and land) inherently provides the most flexible spectrum of options to the NCA.

We analyzed three contingencies where NSNF could prevent or terminate armed conflict. In addition to a reconstituted Soviet theater threat two regional nuclear adversaries, for example, a North Korea armed with nuclear weapons and a federation of Iraq and Iran with nuclear weapons, are representative of future nuclear threats where US vital interests might be at stake.

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Our findings also support NSNF within three services

3. Large utility from Army SNF and SRAM T

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4. Compelling reasons to keep an organic Army capability

An interim SNF delivery capability can be maintained with the W79. Substantial reductions may occur in force structure and materiel requirements but the capability (doctrine, training, leadership) to conduct operations in a nuclear environment will remain.

In the final analysis, the need for SRAM T and Army SNF rests upon perceptions of future threats. We configured a range of threats that, we would argue, are credible in a multipolar world where nuclear weapons are proliferating. The prospect of such a world is not encouraging. If the policies of the US involved confrontation with threats of the magnitude depicted here, then forces to hold at risk about 500 fixed targets and ten divisions might be very reasonable.

The quantitative analyses of the three scenarios and the force structure assessments present strong if not compelling arguments in favor of SRAM T deployment.

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Survivability of theater aircraft would be significantly reduced without standoff from terminal defenses.

Equally strong arguments exist for the Army to keep at least a residual organic capability with the W79.

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6.2(a)  
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Besides the DCA requirements, a number of reasons were given for organic Army capability: low Army costs; cost avoidance of changing service roles; and enhanced survivability, responsiveness, availability, and effectiveness against threat ground forces.

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April 30, 1991

**Recommendations****1. Army should keep an organic capability**

- Maintain the W79 and 8-Inch delivery as an interim system
- At the appropriate time (suggest two years) initiate a study to
  - Formally assess future Strategic Army battlefield nuclear missions
  - Examine organic Army force structure alternatives
  - Define technical options for future nuclear systems

**2. Air Force should develop a theater air-delivered stand-off missile**~~DELETED~~DOE  
6.2(a)  
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We make the above three recommendations based upon the essential findings of this study.

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Washington, DC 20362-5101

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Directorate of Aerospace Studies  
Attn: SA/MS ~~DELETED~~  
Technical Information Specialist  
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TAC Liaison Officer  
TACLO-S  
Kirtland AFB, NM 87117

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Science Applications International Corp  
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McLean, VA 22102

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The Washington Defense Research Group, Inc  
Attn: Security Supervisor  
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1207 Potomac Street, N.W.  
Washington, DC 20007

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c/o General Atomics  
P.O. Box 3142  
La Jolla, CA 92038

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Commandant, US Army Field Artillery School  
Attn: Top Secret Control Officer  
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Fort Sill, OK 73503-5600

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SAF/AQGS  
Director of Strategic, SOF, and Airlift Programs  
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Room 5D543, The Pentagon  
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